

Appl. No. 10/709,155  
Response dated November 11, 2005

### **AMENDMENTS TO THE CLAIMS**

This listing of the claims replaces all earlier versions.

Please amend the claims as follows.

1. (original) A rain runoff gauge, comprising:  
  
a collector tube having an opening for receiving precipitation;  
  
an infiltration circuit providing a reference soil infiltration  
  
resistance in communication with the collector tube;  
  
a runoff circuit in communication with the collector tube providing  
  
runoff characteristics of a surface of the reference soil;  
  
a runoff collection tube to receive runoff from the runoff circuit,  
  
and  
  
a measurement system for reading runoff to the runoff collection  
  
tube.
2. (original) The runoff gauge of claim 1, wherein the runoff circuit  
  
includes an air backflow seal between the collector tube and the  
  
runoff collection tube.
3. (original) The runoff gauge of claim 2, further comprising:  
  
a balance line attached between the runoff collection tube and a  
  
ground surface to maintain a backpressure head in the runoff  
  
circuit matching a water depth above the ground surface.

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4. (original) The runoff gauge of claim 3, further comprising:  
  
a ground connector attached to the balance line having one or more  
  
apertures at a distal end, wherein said distal end is in contact  
  
with the ground surface.
5. (original) The runoff gauge of claim 1, further comprising an  
  
insulating shroud located about the collector tube.
6. (original) The runoff gauge of claim 1 wherein the collector tube  
  
includes a removable bottom closure having a drain hole.
7. (original) The runoff gauge of claim 6 wherein the bottom closure  
  
of the collector tube includes a substantially vertical drip tube.
8. (original) The runoff gauge of claim 1 wherein the collector tube is  
  
cylindrical with an open bottom to receive a sample of the  
  
reference soil when inserted directly into ground.
9. (original) The runoff gauge of claim 1 wherein the collector tube  
  
further comprises a high level recorder.
10. (original) The runoff gauge of claim 9 wherein the high level  
  
recorder comprises a rod coated with a water resistant material  
  
painted with a water-soluble dye, and a cap positioned within the  
  
collector tube above the infiltration circuit and having a surface  
  
area smaller than a cross-sectional area of the collector tube.

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11. (original) The runoff gauge of claim 1 wherein the infiltration circuit includes a reference soil specimen.
12. (original) The runoff gauge of claim 1, wherein the runoff collection tube includes a drain valve.
13. (original) The runoff gauge of claim 1, further comprising a frame connected to the collector tube, a standard rain gauge and the runoff collection tube, wherein the frame is attached to support to maintain the rain gauge and collector tube in a vertical orientation with openings above ground level to receive precipitation.
14. (original) The runoff gauge of claim 1 wherein the runoff circuit includes an independently adjustable runoff resistance.
15. (original) The runoff gauge of claim 14, the runoff circuit further comprising:  
  
an upper horizontal tube and a lower horizontal tube, the horizontal tubes connected by an upstream vertical tube and a downstream vertical tube;  
  
wherein the upper horizontal tube connects an outlet of the collector tube and an inlet of the runoff collection tube, and  
  
includes a non-permeable plug therein, and the lower horizontal tube includes a filter medium; and

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a screw in the downstream vertical tube to adjust flow resistance.

16. (original) A method for measuring rain runoff, comprising:

collecting precipitation in a collector tube;

passing a first portion of the collected precipitation to an

infiltration circuit providing infiltration resistance

characteristics of a reference soil;

passing a second portion of the collected precipitation to a runoff

circuit providing runoff characteristics of a surface of the

reference soil;

collecting the second portion in a runoff collection tube; and

measuring the precipitation collected in the runoff collection tube.

17. (original) The method of claim 16, further comprising:

developing a pressure imbalance wherein a head of water in the

collector tube is greater than a backpressure head in the runoff

circuit provided by a ground level water depth; and

passing water from the collector tube through the runoff circuit to

restore pressure balance.

18. (original) A method for measuring soil infiltration of rain,

comprising:

measuring total precipitation;

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measuring rain runoff according the method of claim 16;

determining soil infiltration by the difference between the total  
precipitation and the rain runoff.

19. (original) A method for calibrating the runoff rain gauge of claim  
14, comprising:

measuring an average maximum water depth for the reference soil  
and a maximum water depth for the collector tube during a rain  
event; and

adjusting the runoff resistance in proportion to any difference  
between the measured average maximum water depth for the  
reference soil and the maximum water depth for the collector  
tube.

20. (canceled)

21. (withdrawn) A method for cultivating plants growing in soil,  
comprising:

positioning a rain runoff gauge adjacent a soil location, wherein  
the gauge includes a collector tube, an infiltration circuit and a  
runoff circuit, the infiltration circuit providing an infiltration  
resistance having characteristics of the soil and the runoff  
circuit providing runoff characteristics of a surface of the soil;

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collecting ambient precipitation in the collector tube;  
passing a first portion of the collected precipitation through the  
infiltration circuit;  
passing a second portion of the collected precipitation through the  
runoff circuit and collecting the second portion in a runoff  
collection tube;  
measuring the second portion in the runoff collection tube;  
measuring total precipitation; and  
irrigating the soil as a function of the measured runoff and  
measured precipitation.